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Important Fact Sheet for Veterinarians

KI Treatment for Animals following a Nuclear Disaster

What's the most important thing owners can do to protect their animals in a Nuclear Disaster?

- If a nuclear disaster happens in your region, LEAVE THE AREA!
- Plan ahead!
 1. Animal owners should make plans in advance with friends, relatives, or shelters for housing their pets during a disaster. This will be helpful for a nuclear accident or any natural disaster.
 2. Animal owners should be encouraged to purchase pet carriers
- Owners can use regular trips to the veterinarian to practice evacuating animals from the home.

What is KI Treatment and what does it do?

- KI is a medication that can be given to humans or animals.
- KI helps protect the thyroid of animals following a nuclear disaster involving radioactive iodine.

Where can veterinarians find information regarding dosing and efficacy of KI?

- Journal articles on the subject include:
 - [Use of radioiodine urinalysis for effective thyroid blocking in the first few hours post exposure](#)
Health Phys 1999 Jan;76(1):11-6
 - [Potassium iodate and its comparison to potassium iodide as a blocker of 131I uptake by the thyroid in rats](#)
Health Phys 1993 Nov;65(5):545-9
- Reference the abstracts on page 2 of this document

Should owners give KI to their animals?

- KI lessens the damage to the thyroid from radioactive iodine rays only. KI does not protect against other harmful radioactive rays released during a nuclear disaster.
- Like all medications, KI can be toxic if not dosed correctly. Documented side effects could include vomiting, drooling, runny eyes, rash, collapse and death. KI should not be used in animals with known allergies to iodine.
- Pharmacies typically don't stock this over-the-counter medication, but may if there is demand in your area.

Are there other sources of information?

- Your county Emergency Management (<http://www.ncem.org>) has County Animal Emergency Plans for response and evacuation, and information on who to contact to get involved in the County Animal Response Team (CART). To learn the status of your county's plan, go to www.ncsart.org/county.asp
- www.nukepills.com has information about KI pills.
- General information on KI & distribution for humans can be found through the Mecklenburg County Health Department, <http://www.co.mecklenburg.nc.us/Departments/health+department/home.asp>

Developed with the State Animal Response Team (SART), NC Veterinary Medical Association (NCVMA) & Clemson University, State Animal Emergency Response Program



The State Animal Response Team (SART) mission is providing prevention, response and recovery for animal emergencies. Our goals are to reduce the occurrence and impact of animal injury and disease, minimize threats to human health, and decrease the economic impact of animal disasters. The team includes a coalition of over thirty-five public and private organizations. It operates under the auspices of the State Emergency Response Team. www.ncsart.org.

REFERENCES ON KI DOSING AND EFFICACY

Health Phys 1999 Jan;76(1):11-6

Use of radioiodine urinalysis for effective thyroid blocking in the first few hours post exposure, Ribela MT, Marone MM, Bartolini P.

Department of Application of Nuclear Techniques in Biological Sciences, IPEN-CNEN, Cidade Universitaria, Sao Paulo, Brazil.

A useful correlation between maximum thyroid uptake and radioiodine urine levels at different times after exposure was developed in order to determine when the intervention with an adequate blocking agent might still be effective. In an animal model (dog), six different doses were administered in the range of 100-600 kBq. The best correlation was found between the ¹²⁵I uptake after 48 h (T-48) and urine radioactivity 4-6 h (U-4, U-5, U-6) after exposure. For the case of U-4, the equation $Y(T-48) = 0.790 X(U-4) + 2.973$ ($r = 0.974$ with a level of significance of $p < 0.001$) was obtained. An analogous study, carried out in humans ($n = 20$) to whom ¹³¹I was administered, showed a similar correlation and level of significance: $Y(T-24) = 1.162 X(U-4) + 3.263$ ($r = 0.926$; $p < 0.001$). The validity of this correlation was confirmed in four volunteers who received small doses of ¹²⁵I (25-100 kBq), with good agreement between measured and extrapolated thyroid uptake and a mean difference of less than 10% (CV = 16.2%). Three different blocking agents were then tested in the same dog: potassium iodide, potassium perchlorate, and a thionamide (Tapazole). The blocking action of the first two compounds was about 90%, as opposed to only 48% for the third compound. Potassium iodide was chosen for its limited side effects and more universal utilization. The final study, carried out with four different doses, indicated that 25 mg of KI is the ideal amount to be administered to the dog. This corresponds to approximately 100 mg for a 70 kg human being (i.e., 1.4 mg kg⁻¹). This dose, when administered to a volunteer 4 h after exposure, provided a thyroid blocking of 68%.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9883942&dopt=Abstract

Health Phys 1993 Nov;65(5):545-9

Potassium iodate and its comparison to potassium iodide as a blocker of ¹³¹I uptake by the thyroid in rats, Pahuja DN, Rajan MG, Borkar AV, Samuel AM.

Radiation Medicine Centre, B. A. R. C., Parel, Bombay.

Potassium iodide is the preferred thyroid blocker for personnel handling radioiodine and is recommended as a prophylaxis for the population in the near-field of a nuclear reactor which would be likely to be exposed to radioiodine in an accidental breach of containment. However, in hot and humid climates, this hygroscopic chemical has a poor shelf life due to hydrolytic loss of iodine vapors. On the other hand, another iodine-rich salt, potassium iodate (KIO₃), is quite stable and has a much longer shelf life. The present study compares potassium iodide and KIO₃ as thyroid blockers and examines the appropriate time at which they should be administered in case of radioiodine exposure. Either of the two were given in recommended dosage (100 mg stable iodine per 70 kg body weight) at -2, 0, +2, +4, +6, and +8 h after administration of tracer quantities of radioiodine (¹³¹I) to age-, weight-, and sex-matched rats. ¹³¹I uptake in thyroid was measured 24 h after its administration in the experimental animals and compared with placebo administered controls. Results suggest that KIO₃ is as effective a thyroid blocking agent as potassium iodide. In comparison to controls, 24-h thyroid uptake of ¹³¹I can be substantially reduced if potassium iodide or KIO₃ is given to the animals within 2-4 h after exposure to ¹³¹I. Another noteworthy observation is that KIO₃ is effective even at 8 h when administered at twice the usual dosage in comparison to the single dose, which does not show appreciable thyroid blocking properties after 8 h.

http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8225995&dopt=Abstract